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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,213	11/13/2003	Joseph D. Rigney	041A.0006.U1(US)	2546
29683	7590	02/25/2005	EXAMINER	
HARRINGTON & SMITH, LLP			BAREFORD, KATHERINE A	
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SHELTON, CT 06484-6212			PAPER NUMBER	

1762

DATE MAILED: 02/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/714,213	<b>Applicant(s)</b> RIGNEY ET AL.	
	<b>Examiner</b> Katherine A. Bareford	<b>Art Unit</b> 1762	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/13/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/03</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

v/b 2. Claims 1-4, 7-8 and 11<sup>are</sup> provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4, 7-8 and 11 of copending Application No. 10/714,430. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of '430 have the same requirements of the respective claims of the present application, except that the claims of '430 use a NiAl coating instead of a "bond coating" as in the present application. However, the NiAl acts as a specific bond coating and thus, the claims of '430 provide all of the features required by the claims of the present application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

*Claim Rejections - 35 USC § 112*

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 12, it is unclear what "M" is required to be.

*Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Draghi et al (US 5972424) in view of Arnold (US 6049978) and Beverly et al (US 6074706).

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Claim 1: Draghi teaches, in the Background Art section, a conventional method of repairing a coated component that has been exposed to engine operation. Column 1, line 10 through column 2, line 20. An engine run component with a base metal substrate is provided. Column 1, lines 40-65. The component has a thermal barrier coating system comprising a bond coat on the base metal and a top ceramic thermal barrier coating. Column 1, lines 30-40. The applied ceramic coating would have a thickness, which can be considered "t". Draghi teaches to remove the thermal barrier coating system. Column 1, lines 45-65. In the removal, a portion of the base metal substrate is also removed. Column 1, lines 55-65. This removed amount would have a thickness, which can be considered " $\Delta t$ ". The substrate, with the coating removed, is inspected to see if recoating is acceptable. Column 1, lines 60-65. If so, a bond coat is reapplied to the substrate as part of the repair. Column 2, lines 1-20. Then a top ceramic coating is applied to the bond coat. Column 2, lines 10-20. Following repair, the parts are inspected again to determine if they are acceptable to return to service. Column 2, lines 10-20.

Claim 2: the component can be a high pressure turbine blade. Column 1, lines 10-30.

Claim 5: the bond coats can be diffusion aluminide. Column 1, lines 25-30 and column 5, line 60 through column 6, line 5.

Claim 6: Draghi indicates that when using diffusion aluminide bond coatings, they can be simple aluminide or modified aluminide. Column 5, line 60 through column 6, line 5.

Claims 7-8: Draghi indicates the base metal of such components can be a nickel based superalloy. See column 5, lines 10-20.

Claim 9: Draghi indicates that when using diffusion aluminide bond coatings, they can be modified with noble metals, which would include Pt and Pd. Column 5, lines 60 through column 6, line 5.

Claim 10: Draghi teaches that the bond coat can contain M Cr Al Y and diffusion aluminide and other elements such as Si, Hf, Ta and Re. Column 6, lines 1-10.

Claim 11: Draghi indicates that the ceramic thermal barrier coating can be yttria stabilized zirconia. Column 7, lines 20-30.

Claim 12: Draghi indicates that the bond coat can be M Cr Al Y. Column 1, lines 25-30 and column 5, line 60 through column 6, line 5.

Claims 13 and 19: Draghi provides a process as discussed with regard to claim 1 above. Furthermore, the substrate can be a high pressure turbine blade. Column 1, lines 10-30. The substrate of such blades can be nickel based alloy. Column 5, lines 10-20. The bond coating can be a diffusion bond coat. Column 1, lines 25-30 and column 5, line 60 through column 6, line 5. The ceramic top coat can be yttria stabilized zirconia. Column 7, lines 20-30.

Claims 16-18: the component can be an airfoil (turbine blade) or static component, such as a turbine vane. Column 1, lines 25-30.

Draghi teaches all the features of these claims except (1) the precise thickness of the reapplied coatings, (2) the restored conditions (claim 2), (3) the weighing (claim 3), (4) the bond coat thickness and  $\Delta t$  (claim 4), (5) superalloy features (claims 7,8), (6) the densities (claims 14, 15).

However, Arnold teaches that when repairing turbine engine parts, one must clearly determine the dimensional difference between pre-repaired dimensions and the desired post-repair dimensions. Figure 1(a) and column 14, lines 5-15. One must determine a buildup thickness of coating material required to obtain the desired post repair dimensions. Figure 1(a) and column 14, lines 10-15. Prior to determining the pre-repaired dimensions, a previously applied protective coating must be removed. Figure 1(a) and column 14, lines 30-40. Multiple layers of coating can be applied, taking into account the desired post-repair dimensions. Column 14, lines 30-40. The part can be a nickel based superalloy. Column 14, lines 50-60.

Beverley teaches a method of applying thermal barrier coatings to turbine components. Column 1, lines 5-10. The substrate can be a nickel based superalloy. Column 1, lines 15-25. The substrate can be single crystal or directionally solidified. Column 1, lines 15-25. A bond coat is applied to the substrate. Column 4, lines 1-10. The bond coat can be diffusion aluminide or M Cr Al Y alloys. Column 4, lines 5-10. A ceramic top layer is applied over the bond layer on the substrate. Column 4, lines 1-15. The ceramic can be yttria stabilized zirconia. Column 4, lines 5-15. The bond coat is applied in a uniform fashion to a thickness of 0.001 to about 0.005 inch (1 to 5 mils). Column 5, lines 1-15. As is shown by figure 2, the bond coat is applied in a uniform fashion, while the ceramic coat can have varying thicknesses, due to the groove in the substrate. See figure 2 and column 5, lines 1-15.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Draghi to perform inspections and measurements to determine how much coating materials need to be applied to the substrate to achieve the desired post repair dimensions

from the time of removal of the coating and part of the substrate as suggested by Arnold so as to provide a desirable repaired part, because Draghi teaches to perform inspections after coating removal and following repair to determine if the parts are acceptable to return to service and Arnold teaches the importance of performing inspections and measurements to determine how much coating materials need to be applied to the substrate to achieve the desired post repair dimensions from the time of removal of the coating and part of the substrate to the time coating application has occurred. It would have been suggested that the post repair dimensions should be about the same as the original dimensions of the turbine component, since the part is to be returned to the service for which it would originally used. It would further have been obvious to modify Draghi in view of Arnold to provide the bond coat thickness about the same as the thickness previously applied and the ceramic coat to be applied to a thickness of  $t + \Delta t$  as suggested Beverley so as to provide a <sup>component</sup> ~~part~~ of original dimensions, because Draghi in view of Arnold teach removal of coating, repair and inspection and reapplication of coating to provide a part of original dimensions, and Beverley teaches that it is desired for bond coats to be applied in a narrow range of thicknesses and the top ceramic coat, on the other hand, can be provided at a variety of thicknesses. It would further have been obvious to weigh the component to determine the amount of coating to apply, because the weight of specific coating materials would parallel the amount of coating to be applied. As to the specific  $\Delta t$  used, it would be a matter of routine experimentation to optimize the thickness to be removed, based on the desired amount that optimizes removal of the top coatings. As to the use of the specific bond coating thicknesses and specific superalloy, Beverley teaches that a 5 mil bond thickness and single crystal or directionally



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solidified substrate are desirable features to use when providing turbine components with thermal barrier coatings. As to the densities, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the references to optimize the densities of the materials, given that the references teach the use of the nickel based superalloy and the yttria stabilized zirconia and that Draghi teaches that various application methods can be used to give the desirable porosity of coating (column 7, line 65 through column 8, line 5) and Arnold teaches that various pressure treatments can be applied to the substrate.


### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:30-4:00) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (571) 272-1415. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
KATHERINE BAREFORD  
PRIMARY EXAMINER